

Automation

Operator Workplace Graphical User Interface

User manual



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Table of Contents

1 Introduction.....	4
1.1 General.....	4
1.2 Abbreviations and definitions	4
1.3 Related documents.....	4
2 Operator workplace.....	6
3 Logging into user interface	7
3.1 Logging in.....	7
3.2 Autostarting with a predefined user	7
3.3 Logging over	7
4 Security	9
4.1 Access restrictions	9
4.2 Object locking	10
4.2.1 Locking an object.....	10
5 User interface overview	11
5.1 Overview	11
5.2 Workplace structure	11
5.2.1 Navigation area.....	12
5.2.2 Content area.....	13
5.2.3 Status area	13
5.2.4 Workplace hotkeys.....	14
5.2.5 Save screenshot.....	14
5.2.6 Print screen	14
5.3 Color scheme	15
5.3.1 Color themes	15
5.4 Indication colors	16
5.4.1 Alarm indications	16
5.5 Elements.....	17
5.5.1 General graphical elements	17
5.5.2 Context menu.....	23
5.5.3 Faceplates	26
5.5.4 Operator note	30
5.6 Pipeline color markings and definitions	31
5.7 Communication line colors	Error! Bookmark not defined.
6 Alarms.....	33
6.1 General.....	33
6.2 Alarm indication and priority.....	35
6.3 Audible alarm	36
6.3.1 Silencing an audible alarm	36
6.4 Alarm line.....	37
6.4.1 Acknowledging alarms via alarm line	37
6.5 Alarm lists.....	37
6.5.1 Acknowledging alarms via alarm list.....	40
6.6 Faceplate alarms.....	41
6.6.1 Acknowledging alarms via faceplate.....	41
6.7 Disabled alarm	42
6.7.1 Viewing a disabled alarm	42
6.8 Hidden alarm.....	42
6.8.1 Viewing a hidden alarm	42

6.8.2 Viewing hiding configurations	43
6.9 Alarm classes and filtering.....	43
6.9.1 Filtering an alarm list.....	43
7 Events.....	45
7.1 Filtering an event list	46
8 Trends.....	47
8.1 General.....	47
8.1.1 Accessing ready-made trends	47
8.1.2 Accessing user-defined operator trends	47
8.2 Trend area	48
8.2.1 Adjusting the trend area size.....	48
8.2.2 Identifying traces.....	48
8.3 Trend header and trend toolbar	49
8.4 Trend table	51
8.4.1 Adding traces to operator trends	54
8.5 Using Silence Alarm Buzzer button	54

1 Introduction

1.1 General

This document describes the visual appearance and the basic use of the graphical user interface developed for the Marine automation platform libraries (MAPL). The document is intended for the graphical user interface operators at the operator workstation in any location monitoring and controlling automation processes onboard of a vessel.

1.2 Abbreviations and definitions

Abbreviation	Definition
FCU	Fan coil unit
HFO	Heavy fuel oil
HT	High temperature
HVAC	Heating, ventilation, air conditioning and cooling
IAS	Integrated automation system
LAN	Local area network
LNG	Liquefied natural gas
LT	Low temperature
MAPL	Marine automation platform library
MDO	Marine diesel oil
MGO	Marine gas oil
OPC	Open connectivity via open standards
P&ID	Piping and instrumentation diagram
PMS	Power management system
RCU	Redundancy controller unit
UI	User interface
UTC	Coordinated Universal Time
VMS	Vessel management system

1.3 Related documents

Document title	Document kind	Document number
Aln and Aln_R Specification	Function Description	3AFV6082944
AlnMean Specification	Function Description	3AFV6121762
AlnWeight Specification	Function Description	3AFV6100543
AnalogPosCtrl Specification	Function Description	3AFV6084934
AOut Specification	Function Description	3AFV6082943
DIn and DIn_R Specification	Function Description	3AFV6082945
Dint_In and Dint_In_R Specification	Function Description	3AFV6097530

Document title	Document kind	Document number
DoubleDIn Specification	Function Description	3AFV6102050
DOut Specification	Function Description	3AFV6082942
DtyStndby Specification	Function Description	3AFV6085021
GroupCtrl2 Specification	Function Description	3AFV6108042
HourCounter Specification	Function Description	3AFV6086378
HW Module Monitoring Specification	Function Description	3AFV6116872
LinearReal21points Specification	Function Description	3AFV6100542
OnOffCtrl Specification	Function Description	3AFV6084932
OnOffCtrl_VSD Specification	Function Description	3AFV6085016
PIDCtrl Specification	Function Description	3AFV6085028
SplitCtrl Specification	Function Description	3AFV6100541
Totalizer Specification	Function Description	3AFV6101883
TwoSpeedCtrl Specification	Function Description	3AFV6085049

2 Operator workplace

Operator workplace is the operator interface of the System 800xA providing control and supervision of processes in integrated automation systems (IAS).

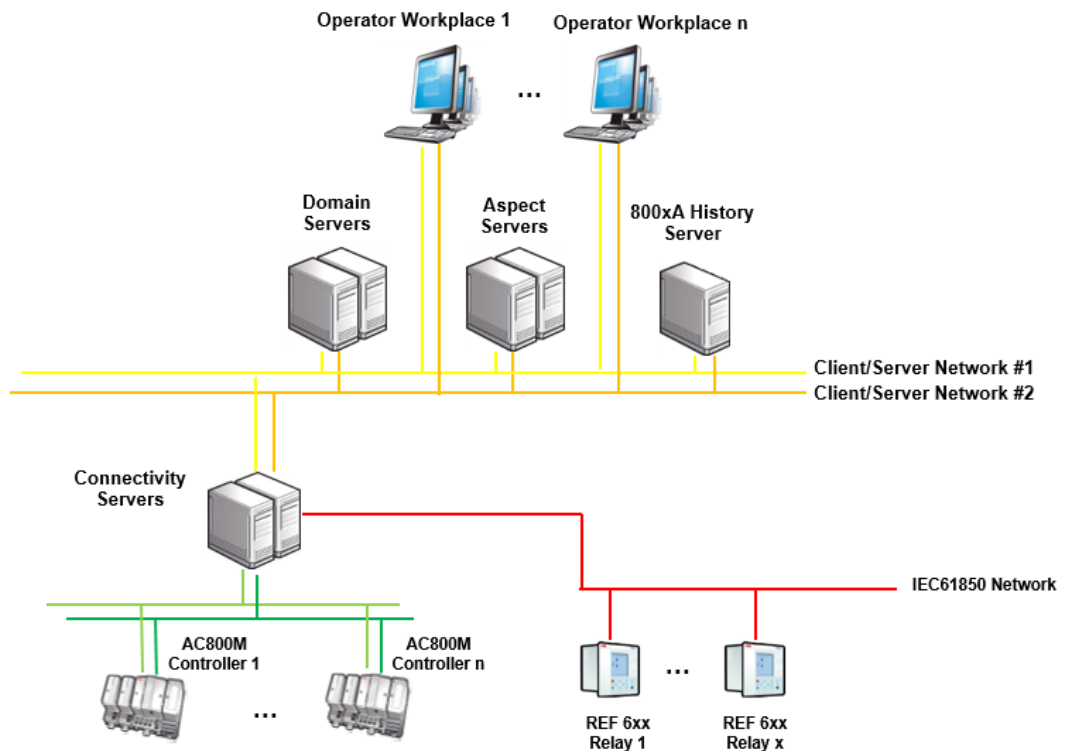


Figure 1 System overview example

Key functions of the operator workplace are listed in the following:

- Graphic displays
- Faceplates for process objects
- Trend data including trend presentation
- Alarm and event management and presentation
- System Status Viewer

Each operator workplace client can have one to four screens.

There can be separate operator workplaces for the following systems:

- HVAC
- PMS
- VMS

3 Logging into user interface

The graphical user interface (UI) is built for the operator workstations which may be single or multiscreen and operated via a pointer device, touchscreen or keyboard.

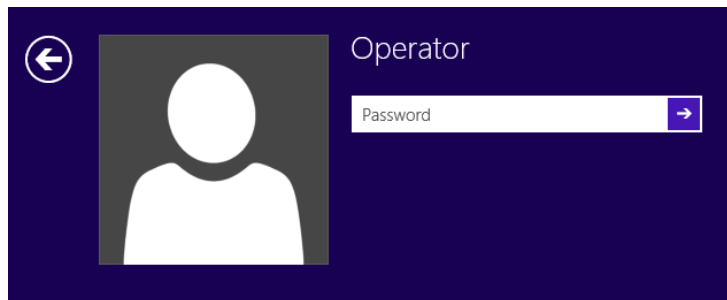
UI is a display representing the actual process, equipment etc. It is also used to show e.g. alarm lists, event lists and trends.

UIs have different access profiles depending on the logged in user. For more details on user permissions, see chapter 4.1.

3.1 Logging in

Access the System 800xA via the Windows login window.

1. Connect by selecting an appropriate user name account and password.



The user can have a predefined workplace which starts after logging in.

3.2 Autostarting with a predefined user

There can be a predefined user defined in the system. After restarting an operator station, the predefined user is automatically logged in.

3.3 Logging over

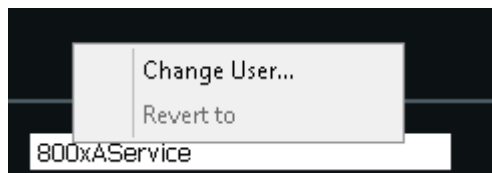
Logging over can be used for temporary user change when already logged in. It is faster than logging in and it also preserves the existing displays of the original user.

To log over, do the following:

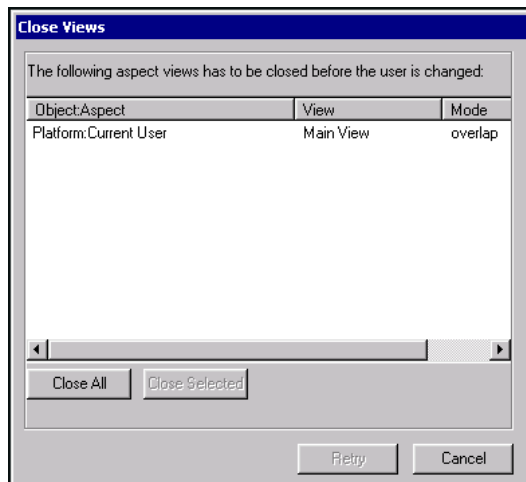
1. Left click on the lower right side corner on the actual user, a white box will appear



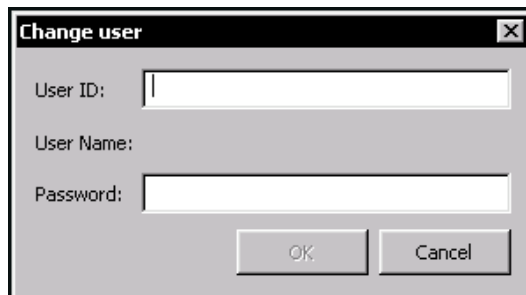
2. Right-click the current user name and select **Change User**.



3. If faceplates are open a popup will appear, close all views by clicking the **Close All** button.



4. Click **Retry**.
The **Change User** window opens.
5. Fill in the **User ID** and **Password** entry fields with the details of the new user.



6. Click **OK**. You can hide the white box with left click on the User. During Log-over time user indication will blink because a different user is in use.

You can then switch back to the original user:

1. Right-click the current user name shown in the white box and select **Revert to**.
2. Fill in the **User ID** and **Password** entry fields with the details of the original user.

4 Security

4.1 Access restrictions

Operations and actions in the system can be assigned different required permissions. This assignment defines what permission (e.g. Read, Operate, Tune and Configure) you need to perform the operation or tuning action. As an example, changing a setpoint value typically requires the Operate permission and setting of alarm limits may require Tune permission. Each attribute of a control object can have a different permission assigned, so that access rights can be differentiated down to a particular operation of an object.

The foundation for the System 800xA user administration is the Windows user administration. You are registered in a domain, and can belong to one or more groups. The user group can be freely selected, but it may simplify user administration if the user groups correspond to the Industrial IT user groups. Defined roles and permissions control what functions are accessible to a certain user group (here Industrial IT user groups apply).

The logging over (chapter 3.2) can be performed to change to the user having a permission for the required action (e.g. Tune).

Table 1 Example of user permissions connected to user groups

User Group	Read	Operate	Tune	Configure
System Engineers	x	x	x	x
Engineer Users	x	x	x	
Operators	x	x	-	-
View Only Users	x	-	-	-

Table 2 Example of users connected to user groups

User Group	Users
System Engineers	
Engineer Users	asrestorer\ENG
	asrestorer\CE
	asrestorer\EE
	Supervisor (Remote conn. appr.)
	Prilog
Operators	asrestorer\ECR
	asrestorer\OCR
	asrestorer\WH
	asrestorer\ER
View Only Users	asrestorer\VIEWER

4.2 Object locking

When the operator locks the object, other operators lose the permission to operate the same object. All buttons and setpoints are reserved only for the operator who has locked the object. To release an object lock, the operator owning the lock can manually unlock it, or the operator can close the faceplate. The object lock may time out after a default time of four minutes. A privileged user can also break the object lock through the context menu of the **Lock control** button.

4.2.1 Locking an object

- 1. Click the **Lock control** button in the faceplate top row.



A locked object is indicated in the graphic display.

Table 3 Locking indications

Description	Graphical appearance
Locked by me	
Locked by another user	

If locking the object is compulsory for the operation, all buttons and commands are disabled until the user locks the object.

5 User interface overview

This chapter describes the graphical user interface of the operator workplace offering an overview of the layout and navigation logic, available graphics and color indications.

5.1 Overview

The user interface is presented on the operating screen(s), and a pointing device (mouse) and keyboard are used for the operation. You can operate the system through visual indicators such as icons and text.

The UI consists of the following:

- Workplace layout/frame
- Dynamic and static objects
- Faceplates
- Alarm/Event/Trend windows

5.2 Workplace structure

Workplace is divided into three areas as follows and depicted in Figure 2:

- Navigation area (1)
- Content area (2)
- Status area (3)



Figure 2 Workplace composition

Navigation area and status area are always visible whereas the content area changes depending on the navigation tab selection.

5.2.1 Navigation area

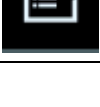
The key elements of the UI control are positioned in the navigation area displayed on the top part of the screen.



Figure 3 Navigation area

The navigation area is a horizontal top-down system consisting of a top level and a maximum of two sublevels which become visible when selecting a tab. There is a color indication in the tabs presenting which system view or views are open. Tabs also have an alarm indication. Refer to chapter 6 for more details.

Table 4 Navigation area buttons

Description	Button
Drop-down menu for auxiliary functionalities	
Save Screenshot	
Print screen	
Close all overlaps	
Silence alarm buzzer (optional)	
Previous view in history	
Next view in history	
Color theme selection	
Event list	
Alarm List	

Description	Button
System alarm indication (the number of active alarms visible in the lower right corner)	

The navigation area also offers a list view of the alarms in which the latest three alarms are visible. You can view more alarms by scrolling down the list.



Figure 4 Alarm list in the navigation area

5.2.2 Content area

Content area has the information related to the current selected display and showing the process equipment graphics with statuses and P&IDs etc.

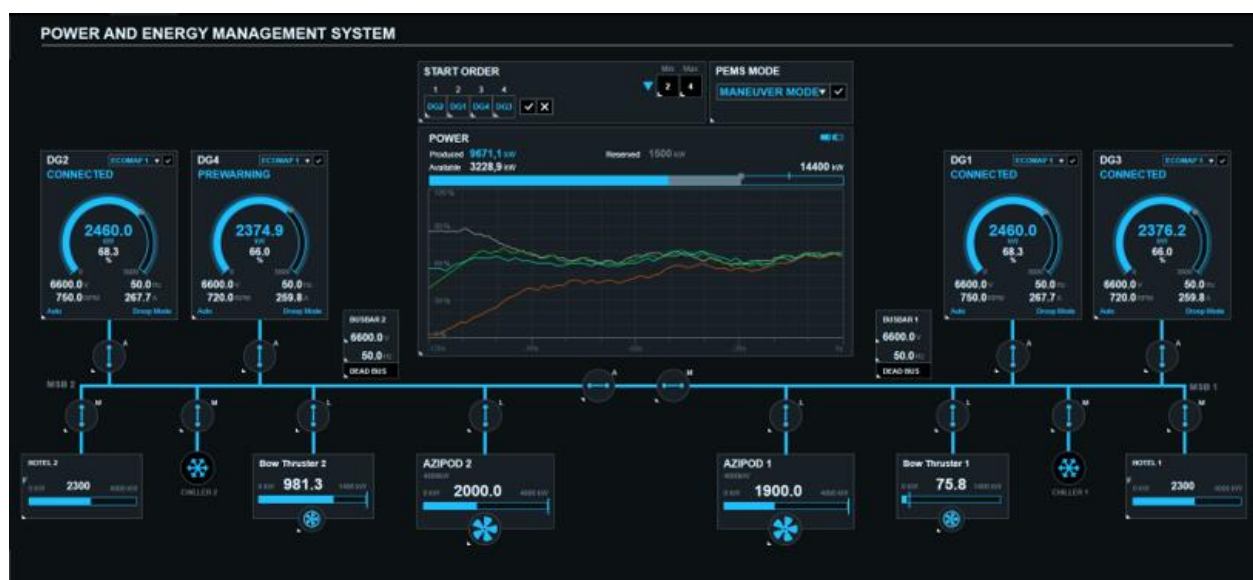


Figure 5 Content area

5.2.3 Status area

Status area is positioned in the lowest part of the screen and it is reserved for the following data:

- Current UTC
- Operator information

Table 5 Status area

Description	Graphical appearance
Current UTC	
Operator information	

5.2.4 Workplace hotkeys

You can expedite a set of operations by using the sequence of keys referred to as hotkeys provided for the workplace use.

Table 6 Workplace hotkeys

Hotkey	Description
ALT+7	Show Cursor
CTRL+F	Find Tool
CTRL+P	Print Screen
F2	Print Screen
CTRL+S	Take Screenshot
F3	Take Screenshot
CTRL+SHIFT+7	System Status
CTRL+SHIFT+S	External Alarm Silence
ALT+F4	Close Active Window
F5	Close All Overlaps
F9	Navigate to Previous Display
F10	Navigate to Next Display

5.2.5 Save screenshot

Take screenshot function is used for taking screenshots to save visible screen(s) to files named according to the computer name and time and store them to a specific Screenshot folder located inside Virtual Printer PC (Prilog).

The function is activated as follows:

1. Click the print screen button.



Alternatively:

1. Use the Ctrl+S hotkey (additionally, the F3 function key activates the print function).

5.2.6 Print screen

Print screen function is used for taking screenshots to save visible screen(s) to files with a name according to the computer name and time and printing them to a default printer if defined. Screenshot files are saved to a Screenshot folder.

There are two options to activate the print screen function.

Option 1:

Click the print screen button.



Option 2:

Use the Ctrl+P hotkey (additionally, the F2 function key activates the print function).

5.3 Color scheme

The color scheme of the system is based on black and white (night and day) recognizing the need for the 24/7 presentation of the system. Limited color palette and optimized color contrast with flat graphics improves safety, effectiveness and usability during operation.

5.3.1 Color themes

There are two color theme variants for different needs, see Table 7. Both themes follow the same functional structure and indication philosophy.



Figure 6 Color theme variants

You can switch the color theme from the main navigation area.

1. Click the color theme selection button.

The **Night** and **Day** options become visible.



2. Click the option suitable for your purposes.

Table 7 Color themes and intended use

Theme	Definition
Night (1)	- Default interface theme - Intended for the office and onboard automation monitoring and controlling - Optimal when working for lengthy periods of time - 700-1000 mm viewing distance - Most feasible option when dimmed on the bridge during the night time operation
Day (2)	- Intended for the office and onboard automation monitoring and controlling - Optimal when working for lengthy periods of time - 700-1000 mm viewing distance - Most feasible option when subjected to the glare of the sun or other reflections - Avoid in the low-lit environment such as locations in which the onboard applications are customarily used

5.4 Indication colors

Certain colors and other additional, graphical indications, such as blinking, are used to present a particular status or functionality in the automation system. For better user guidance all the graphical elements can indicate status by changing the color of the icon, typeface, outline and content background. Blue color indicates e.g. a running motor, open valve or closed breaker. In the night color theme, the white color indicates e.g. a stopped motor, closed valve or open breaker.

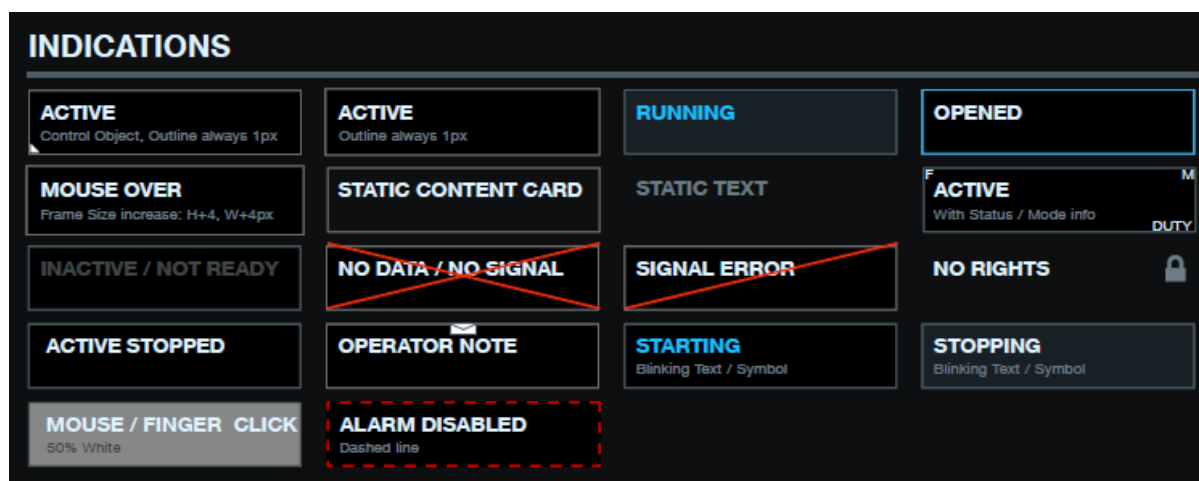


Figure 7 General indications

5.4.1 Alarm indications

When an alarm occurs, the system reacts with an indication logic to guide the user. Refer to chapter 6 for more details.

5.5 Elements

5.5.1 General graphical elements

Process graphic icons

Process graphic icons as visual representations of functions or objects are used in the workplace. They are simplified and generic illustrations of the actual functions or devices. Static icons have neither background nor outline. Some examples of the dynamic process graphic icons (round) can be seen in Figure 8.



Figure 8 Process graphic icons

Examples of button and status icons (square) are presented in Figure 9.

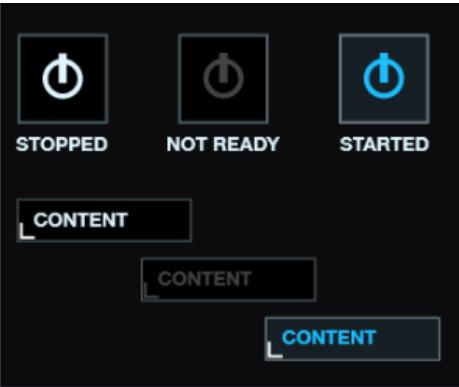


Figure 9 Button and status icons

Process graphic icons and buttons indicate similarly. Usually process graphic icons retain the same visual appearance but change the color according to the designated indication. However, with pumps, valves and breakers the representation of the icon changes, offering visual data that indicates the change, e.g. an altered flow direction.

Table 8 Examples of changing icons

Element name	Graphical appearance in night theme	Graphical appearance in day theme
Pump		
Valve		
Breaker		

Indication labels are used in the context of the process graphic icons to provide additional details. The following tables offer some examples of the indication labels, their locations and the meaning:

Table 9 Upper left corner

Letter	State description	Graphical appearance
F	The actuator is in forced state	

Table 10 Upper right corner

Letter	State description	Graphical appearance
A	Auto mode; the device follows the process control	
M	Manual mode; the device is controlled from the faceplate	
B	Blackout is active	
L	Local mode: the device is controlled from the local control box	
S	Sequence mode: the device is controlled from the group	

Table 11 Lower right corner, the 1st in the table has the highest priority

Letter	State description	Graphical appearance
I	Active interlock	
IB	Active interlock blocked	
B	Block used, no active interlocks	
E1	External 1 setpoint	
E2	External 2 setpoint	

Letter	State description	Graphical appearance
T	Track mode	

The color of the graphical element indicates its status. Both process graphic icons and buttons have color indications, i.e. the visual presentation informs the state of the process in question. As an example, an active state is presented with a solid fill of the icon whereas an inactive state is presented with the outline of the icon only.

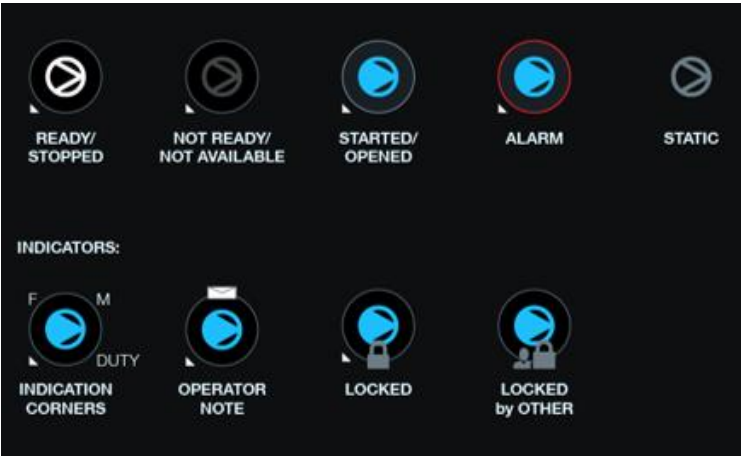


Figure 10 Indications in process graphic icons

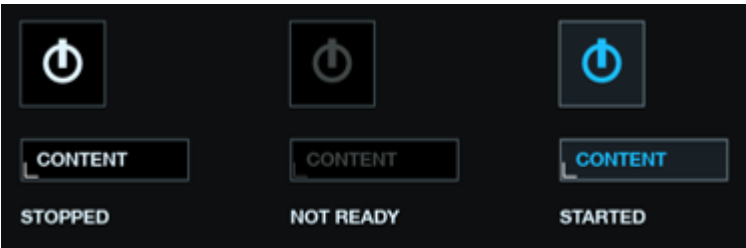
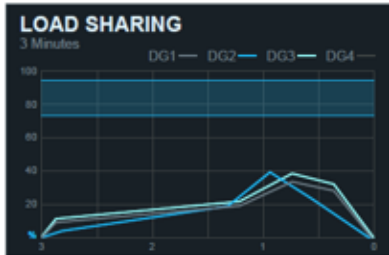
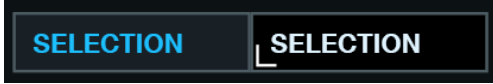
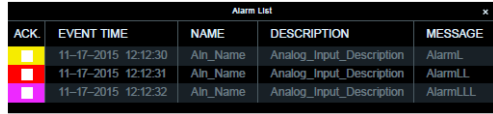


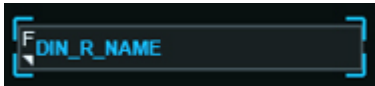
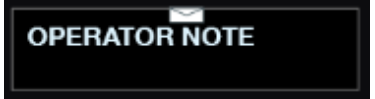
Figure 11 Indications in button icons

Table 12 offers more details on the graphical elements used in the system.

Other visual representations

Table 12 Additional graphical elements

Element	Description	Graphical appearance
Bar graph	- Visual representation of numeric data, the length of which equals to the proportional value it represents - Can be shown together with the scale indication setpoint and alarm limits - Independent of the color themes - Gauge bar graph: Single and multibar variants - Rectangular bar graph: Vertical and horizontal variants	
Graph	- A visual representation of process history during a certain timeframe - A trace area marked with color overlay - Color-coded curves	
Radio button	- Used as a single button or a group of buttons - One option selected at a time	
Drop-down list	- From 5 to 15 options available; if more, options are sorted to separate lists	
List view	- Data on alarms and events	

Element	Description	Graphical appearance
Triangle	- Located in the lower left corner - By clicking the element a faceplate opens - By clicking the element a user input field opens to which you can enter values - When the faceplate is open, the indicator triangle is mirrored	
Active faceplate	- Highlighted element corners indicate an active faceplate	
L indicator	- By clicking the element, a command is directly sent	
Operator Note	- Notes left by the operator available related to a particular object or system	
Lock	- Functionality is locked by you - You can see if someone else has locked functionality	
Mouse over	- Slightly enlarges the area in which the mouse is located - Assists in locating the mouse when multiple views are open	

5.5.2 Context menu

Context menu provides quick access to various aspects and features of a particular device or system. Right-clicking a graphical element, display background, an event in the event list or an alarm in the alarm list launches the context menu, the content of which depends on the clicking location.

Table 13 Context menu of the device (graphical element)

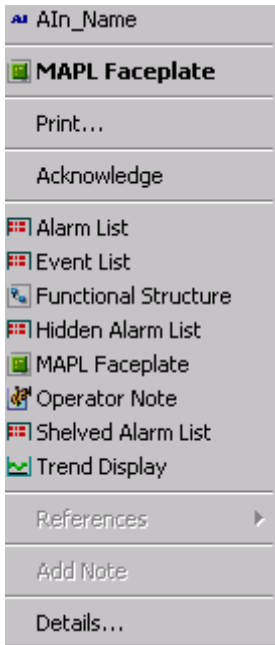
Content	Figure
- Faceplate - Print command of the display - Acknowledge all alarms of the device - All alarm lists of the device - Event list of the device - Operator note - Trend display	

Table 14 Context menu of the background

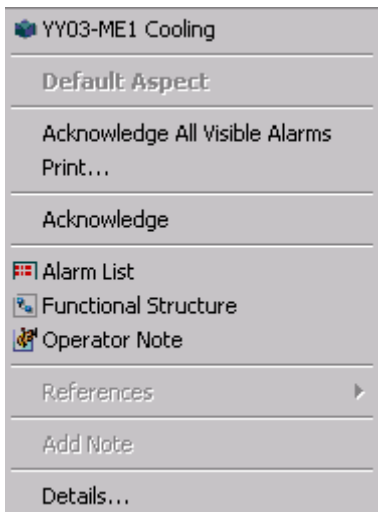
Content	Figure
- Acknowledge all visible alarms - Print command of the display - Alarm lists of the display/area	

Table 15 Context menu opened from an alarm in the alarm list

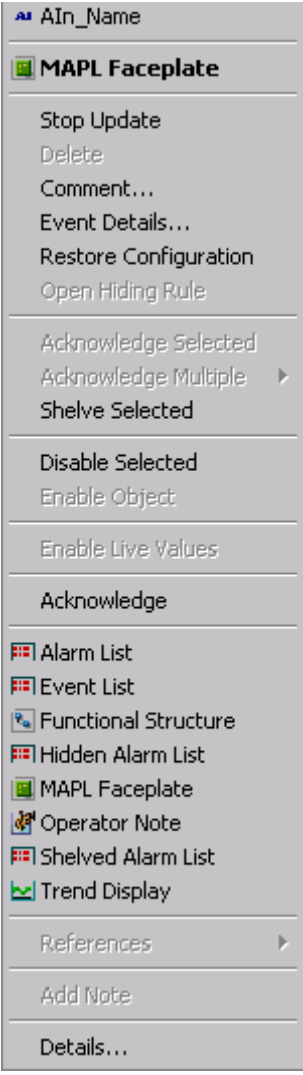
Content	Figure
- The same options as in the context menu of the element itself + the following: - Stop updating the alarms - Comment of the alarm - Event details - Restore configuration - Acknowledge, shelve and disable the selected alarm	

Table 16 Context menu opened from an event in the event list

Content	Figure
The same options as in the context menu of the element itself + the following: - Stop updating the alarms - Event details - Restore configuration - Acknowledge the selected event	

5.5.3 Faceplates

Each dynamic element has a faceplate for monitoring and controlling purposes. A faceplate opens when clicking an element. Alternatively, a faceplate opens by right-clicking the context menu of each element. You can have a maximum of 10 faceplates open at a time. If you open the 11th, the initially opened one closes.

The following content areas depending on the element can be found on a faceplate as seen in Figure 12:

- Windows bar (1)
- Alarm, Control lock, External links (2)
- Device data (3)
- Navigation (4)
- Content area (5)
- Control buttons (6)



Figure 12 Faceplate

For more details on faceplates specific to a control module, refer to the Function Description of each control module.

Tab navigation

Tab navigation consists of either one or two rows of tabs. If the faceplate contains only one display, there is no separate tab structure. Active display (1) is indicated with blue color. If there are more tabs available but not visible in the view, scrollable tabs (2) are used to indicate that.

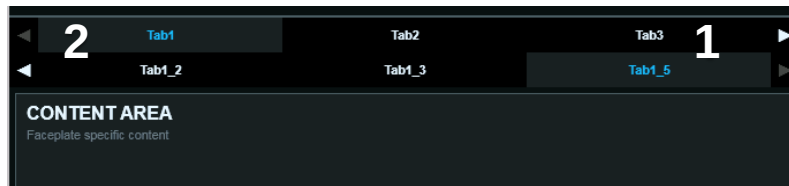


Figure 13 Tab navigation

Device data

Device data defines device-related details. Header and description (1) display static information concerning the device while the mode and status field (2) display dynamic information of the device. The mode field offers information such as central or local control mode, while the status field displays e.g. a running status and direction. Not all faceplates include the mode and status information.

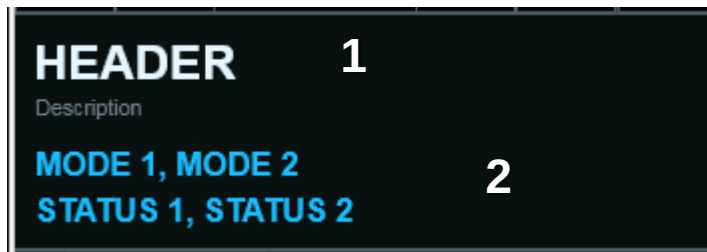


Figure 14 Device Data

Link buttons

Link buttons are positioned in the top row of the faceplate. They provide links to various displays related to the device such as bar graphs and alarm lists (see Table 17 for the button details).

Some devices are control sensitive and the faceplate may contain a locking option. The lock control button (1) is positioned on the top left corner of the faceplate. Locking the faceplate disables the use from other users and the status is displayed with different icons (see Table 17).

If the device consists of alarm information, alarm list (2) and alarm control button (3) are also displayed on the upper right corner of the faceplate. For more information on the alarm handling see chapter 6.

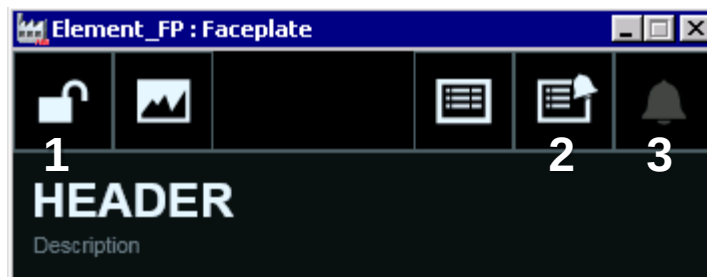
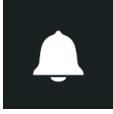


Figure 15 Top part of the faceplate

Table 17 Faceplate top row buttons

Button	Description	Icon
Lock control	Object lock status: Not locked Locked by me Locked by another user	  
Drop-down menu	Opens a drop-down menu containing links to e.g. Operator note, Group control and PCC List	
Operator note	Opens a note window No notes Contains notes	 
Trend	Opens a trend window	
Event list	Opens an event list window	
Alarm list	Opens an alarm list window	
Alarm control	Indicates device-specific alarm status Acknowledges all alarms of the device if configured	

Control buttons

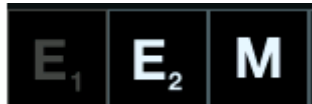
Control buttons are positioned in the bottom row of the faceplate and the selection of control buttons depends on the controllable object.



Figure 16 An example of the bottom part of the faceplate

Some examples of the most common control buttons are provided in the following table:

Table 18 Faceplate control button examples

Button	Action	Icon
Start/Stop On/Off	Start command On command	
	Stop command Off command	
Auto/Manual mode	Auto mode on command	
	Auto mode off command (Manual)	
Multiple state selection	E1 and E2 mode commands are selectable, manual mode is selected	
	E2 and manual mode commands are selectable, E1 mode is selected	
	E1 and manual mode commands are selectable, E2 mode is selected	

5.5.4 Operator note

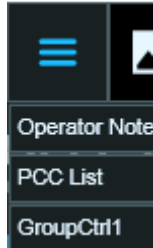
It is possible to e.g. inform other operators about details in device use or status by using the operator note.

There are multiple ways of opening the operator note:

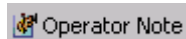
1. Click the **Operator Note** button in the faceplate.



2. Click the drop-down menu button in the faceplate and select the **Operator Note** option.



3. Right-click an object and select the **Operator Note** option from the context menu.



You can enter free text in the message area of the **Operator Note** window.

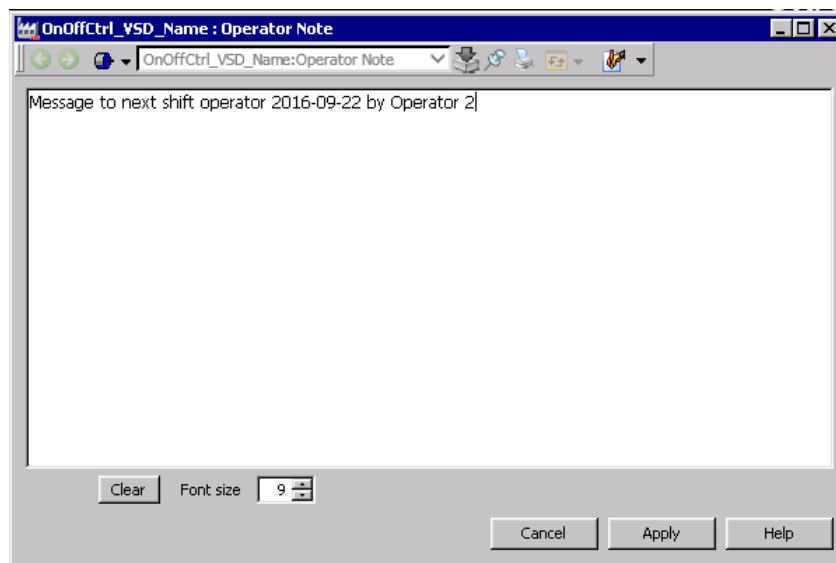


Figure 17 Operator Note window

The existing operator message is indicated in the process graphic icon with an envelope. The envelope is deleted when the operator note is emptied with the **Clear** and **Apply** buttons.



Figure 18 Process graphic icon with an envelope indication

5.6 Pipeline color markings and definitions

The pipeline color markings are defined for substances so that they are suitable for both day and night themes.

The pipe and arrow colors are dimmed 50%. If dynamic pipe coloring is used, the full color is used when the substance is in the pipe.

Table 19 Pipeline colors

Visual	Definition	Color
	Gas, Steam & Air	silver R180 G180 B180
	Service Air System	silver + green
	Instrument System (Control Air)	silver + violet
	Drains	silver + black
	Start / Starting Air	silver + orange
	Steam	silver + yellow
	Fresh Air	silver + blue
	Used Air	silver + brown
	FCU Air (Fan Coil Unit)	silver + red
	Waste	black R81 G81 B81
	Black Water	black + blue
	Gray Water	black + yellow
	Bilge Water	black + green
	Oily Bilge	black + orange
	Exhaust Gas	black + silver
	Garbage	black + maroon
	Effluent	black + violet
	Waste / Sludge Oil	black + brown
	Fresh Water	blue R0 G120 B160
	Technical Water	blue + black
	HT Cooling Water	blue + red
	LT Cooling Water	blue + violet
	Hot Potable Water	blue + maroon
	Cold Potable Water	blue + green
	Feed Water	blue + silver
	Fire Fighting	red R255 G0 B150
	Fresh Water	red + blue
	Sea Water	red + green
	CO ² Gas	red + silver

Visual	Definition	Color
	Sprinkler / Drencher	red + orange
	Powder / Foam	red + yellow
	HiFog / WaterMist	red + brown
	Fuel	brown R150 G120 B80
	MGO (Marine Gas Oil)	brown + orange
	HFO (Heavy Fuel Oil)	brown + black
	MDO (Marine Diesel Oil)	brown + yellow
	Aviation Fuel (Petrol)	brown + blue
	LNG	brown + silver
	Flammable Gas	yellow R255 G153 B0
	Hydrogen	yellow + blue
	Acetylene	yellow + silver
	Propane / Butane	yellow + red
	Oxygen	yellow + green
	Oil	orange R255 G100 B0
	Lube Oil	orange + violet
	Sludge Oil	orange + brown
	Used Oil	orange + black
	Thermal Oil	orange + blue
	Sea Water	green R0 G180 B20
	Ballast / Heeling Water	green + violet
	Cooling Sea Water	green + yellow
	Sanitary Sea Water	green + brown
	Acids, Alkalis	violet R150 G80 B230
	Masses (dry & wet)	maroon R100 G50 B50

6 Alarms

6.1 General

Alarm indications are used to guide the user with the system in case an alarm occurs.

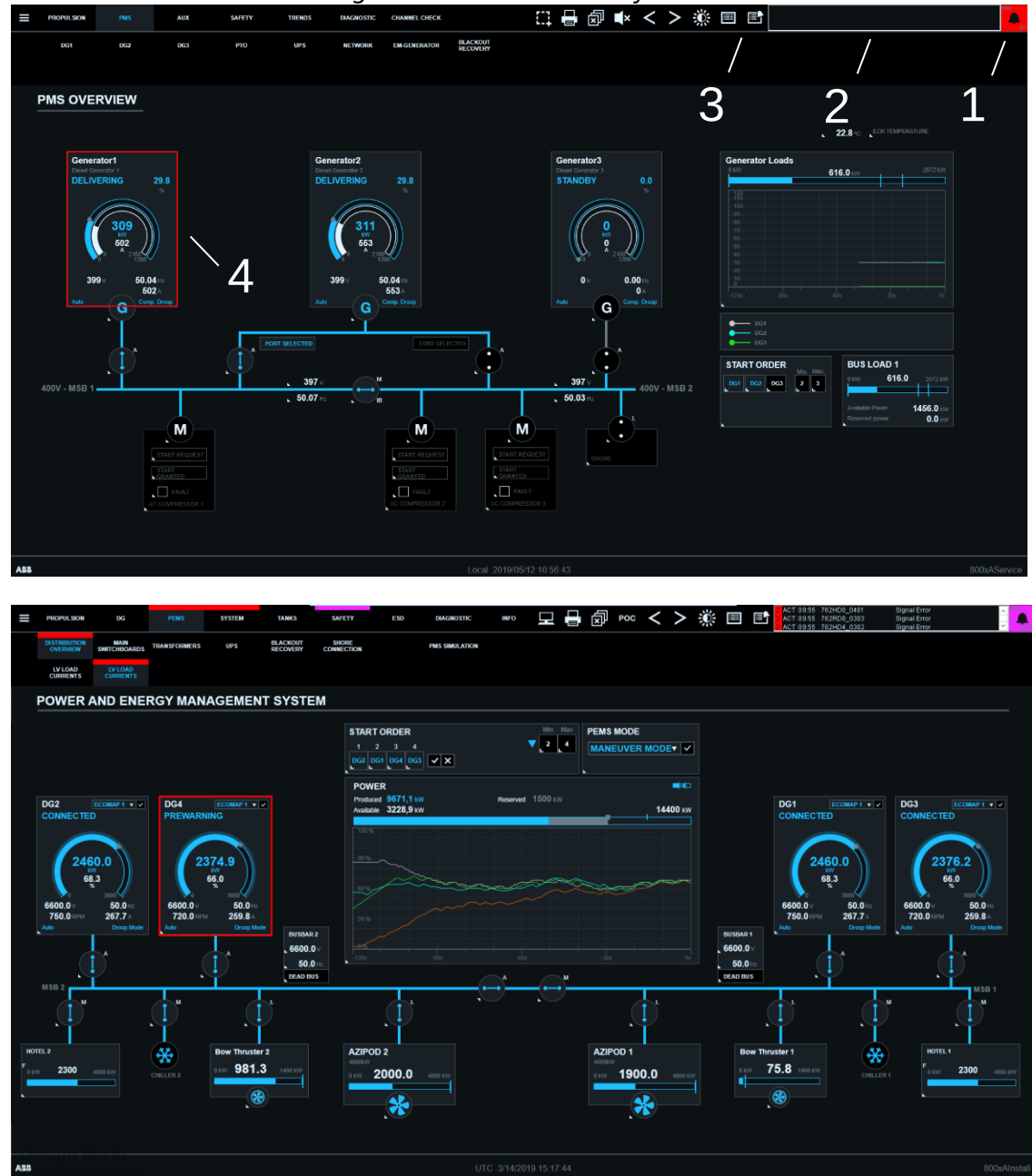


Figure 19 Alarm indications in a workplace

When an alarm occurs (workplace view):

1. An activated alarm indication icon is presented in the workplace, located in the top right corner.
2. The alarm line shows the last three active alarms.
3. The alarm list button offers a drop-down menu of the links to several specialized alarm lists of the complete system depending on the system configuration.
4. In the content area, the outline of the relevant graphical elements indicate an alarm state and priority.

When an alarm occurs (faceplate view):

1. An activated alarm control indication icon is presented in the faceplate, located in the top right corner.



Figure 20 Alarm control icon in the faceplate

indication and priority

Indication colors, blinking and dimming are used to indicate the state and priority of the alarm as seen in **Error! Reference source not found..**

The following alarm priorities are indicated in the colors and listed in the priority order:

- Alarm, Emergency (highest priority): red
- Warning: red
- Caution (lowest priority)

Alarm state is indicated with an icon on a faceplate or in the outline of the graphical element as seen in Table 20. The presented color is according to the priority of the alarm as in **Error! Reference source not found..**

Table 20 Alarm indications (priority 2 alarm example)

Alarm state	Indication	Alarm control icon	Process graphic icon
Active unacknowledged alarm	Blinking		
Active acknowledged alarm	Non-blinking		
Inactive unacknowledged alarm	Blinking, dimmed		
Automatically disabled by the system	Dashed line		
Manually disabled by the user	Dashed line, no alarm color		
Inhibited by the process	Dashed line, no alarm color	-	
Hidden alarm	Dashed line		

Alarm state	Indication	Alarm control icon	Process graphic icon
Shelved alarm	Dashed line		
No alarms	No indication		
Alarms include hardware/system alarm(s)	Any indication color - Specifying HW letters in the alarm icon		-

6.2 Audible alarm

It is possible to silence audible alarms. Silencing the buzzer is disabled from the other users except the Responsible User when there is one, refer to chapter **Error! Reference source not found.** Note that a silenced alarm remains active and needs operator attention and possible corrective actions to retain the normal state. Silenced alarm is normally visible, remains blinking as a new alarm and is active in all related graphic displays and alarm lists until it is acknowledged.

6.2.1 Silencing an audible alarm

1. Click the **Silence Alarm Buzzer** button in the workplace top row.



Alternatively:

1. Click the dedicated silencing quick button if it is configured.

6.3 Alarm line

Alarm line in the navigation area of the workplace has the latest three alarms visible. More alarms can be viewed by scrolling the alarm line. Alarms can be acknowledged individually from the context menu. Also other actions concerning the alarm or alarm causing device are available from the context menu. See Figure 21.

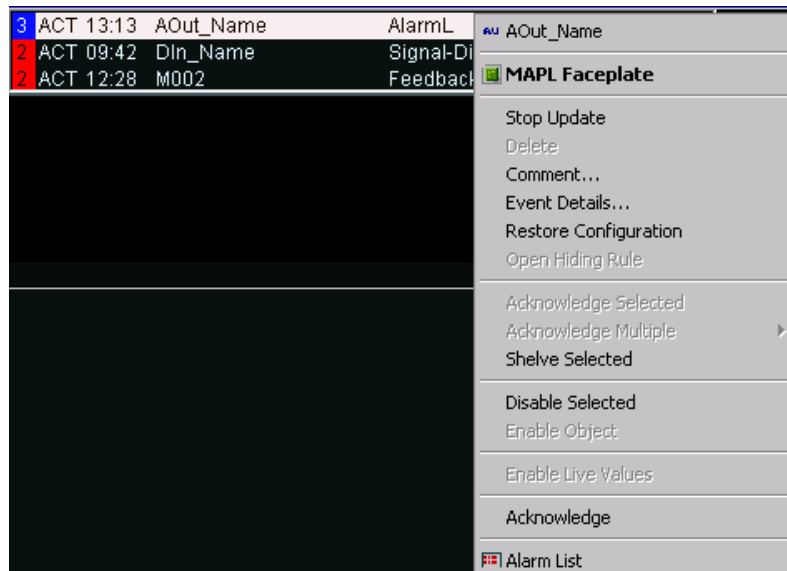


Figure 21 Alarm line with context menu opened from the top most alarm

6.3.1 Acknowledging alarms via alarm line

You can acknowledge alarms individually via the provided context menu.

1. Right-click the alarm in the alarm line.
The context menu opens.
2. Select **Acknowledge** to acknowledge the selected alarm.

6.4 Alarm lists

There are several specialized alarm lists of the complete system accessible from the workplace top row button:

- Process alarm list, an overall alarm list of the system (e.g. PMS or Thrusters)
- Hardware and system alarm list, representing errors or other variation of the HW status (e.g. Diagnostic)
- Blocked alarm list, representing all manually disabled alarms

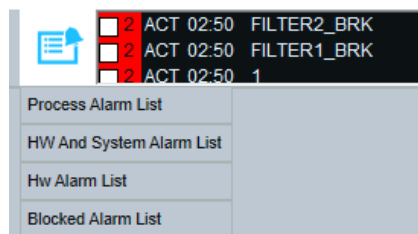


Figure 22 Alarm list drop-down menu button

In addition to these there are the following alarm lists:

- Alarm lists for a certain area (accessible from the active alarm band in the navigation tab)
- Alarm list of the individual device (accessible from the context menu or from the faceplate top row button)

Alarm lists show only active or unacknowledged alarms. When the alarm condition returns to a normal state and the alarm is acknowledged, it is automatically removed from the alarm list.

The bottom line of an alarm list tells the number of unacknowledged, active, inactive, hidden and shelved alarms.

Ack	State	EventTime	ObjectName	ObjectDescription	Message	Class	Cond
☒	ACT	09-06T14:49:35	AOut_Name	Analog_Output_Description	AlarmH	4002	AlarmHL
☒	ACT	09-06T14:49:30	AOut_Name	Analog_Output_Description	AlarmHH	4002	AlarmHLL
☒	ACT	09-06T14:49:30	AOut_Name	Analog_Output_Description	AlarmHHH	4002	AlarmHHLLL

Unacknowledged: 2, Active: 3, Inactive: 0, Hidden: 0, Shelved: 0, Disabled: 7

Page 1 of 1

Figure 23 Alarm list of an individual device

Alarm list consists of a column structure offering details for each indicated alarm and a set of buttons providing functionality.

Table 21 Alarm list columns

Alarm list column	Description
Ack	Acknowledge state and priority level of the alarm: By clicking the checkbox on the left, the alarm can be individually acknowledged. Checked = acknowledged. Color indicates the priority of the alarm (see Error! Reference source not found.)
State	Alarm state: ACT = Active RTN = Inactive (Return-To-Normal) ABL = Automatically blocked/ AutoDisabled/ BlockedRepetitive MBL = Manually blocked/ Disabled HID = Hidden
EventTime	Time of alarm occurrence (Month-Day T Hour:Minute:Second)
ObjectName	Tag number of the alarming device or system
ObjectDescription	Alphanumeric tag description of the alarming device or system
Message	Alarm cause message
Class	Class number if alarm class is used
Cond	Name of the alarming function block in the software

Table 22 Alarm list buttons

Alarm list button	Description
	Pin/unpin the alarm list
	Print the list
	Start, restart or stop list updates. If you click the Start/Stop button the alarm list stops updating until you click the button again. While the list update is stopped, you can easily view the error list. When the alarm list is stopped, a red and orange frame is shown around the alarm list to indicate that the list update is stopped.
	Acknowledge selected alarms in the alarm list
	Acknowledge all visible alarms in the alarm list
	Opens a window with extended information about the selected alarm
	Show events. Opens an alarm list with all alarm events including alarms which have returned to normal.
	Show shelved alarms. Opens an alarm list where shelved alarms are moved after shelving.
	Select runtime attribute filter. Removes the current filter. Click the drop-down menu to select a predefined attribute filter. A selected filter is indicated between the toolbar and the alarm list. Not for operator use.
	Page up/page down. Shows the previous/next 500 alarms in the list.
	Connected to all servers. Opens System Status Viewer.
	View configuration. Not for operator use.
	Reset runtime configuration changes. Restores the initial view if any changes are done to the alarm list.
	View hiding configuration. Opens Hiding Mask Manager for viewing alarm hiding masks.
	Print List. The current list is printed on a default local or network printer.
	Print Preview. The current list is presented in a preview window (only if you have a printer software installed on your workstation).
	Online Help for more information.

Table 23 Hotkeys in the alarm list window

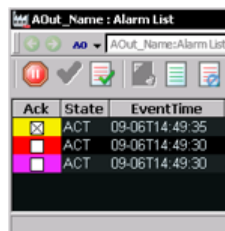
Button	Description
CTRL+C	Copy to clipboard
CTRL+A	Select all Alarms/Events
CTRL+SHIFT+ALT+U	Stop Update
CTRL+R	Remove Selected
CTRL+SHIFT+ALT+R	Remove Page
CTRL+SHIFT+ALT+W	Remove Whole List
CTRL+SHIFT+A	Acknowledge Selected
CTRL+SHIFT+ALT+A	Acknowledge Page
CTRL+SHIFT+R CTRL+SHIFT+Q	Acknowledge Object
CTRL+ALT+W	Acknowledge Whole List
CTRL+SHIFT+Home	Reload Configuration
CTRL+SHIFT+D	Show Details
CTRL+SHIFT+PageUp	Page Up
CTRL+SHIFT+PageDown	Page Down
CTRL+SHIFT+ALT+M	View Hiding Configuration
CTRL+ALT+P	Print List
CTRL+SHIFT+ALT+P	Print Preview

6.4.1 Acknowledging alarms via alarm list

Acknowledging an alarm keeps the alarm in the alarm list, silences the audible alarm and leaves the visual indication solidly on. When the alarm cause has been removed, the alarm is automatically removed from the alarm lists, but remains in the event lists for possible later observations.

There are multiple ways of acknowledging alarms in the alarm list:

1. Acknowledge an individual alarm by checking the checkbox in the **Ack** column.



2. Acknowledge an individual alarm by selecting the alarm and clicking the **Acknowledge** button on the toolbar.



3. Acknowledge all alarms that are visible on the alarm list display by clicking the **Acknowledge the Visible Alarms** button on the toolbar.



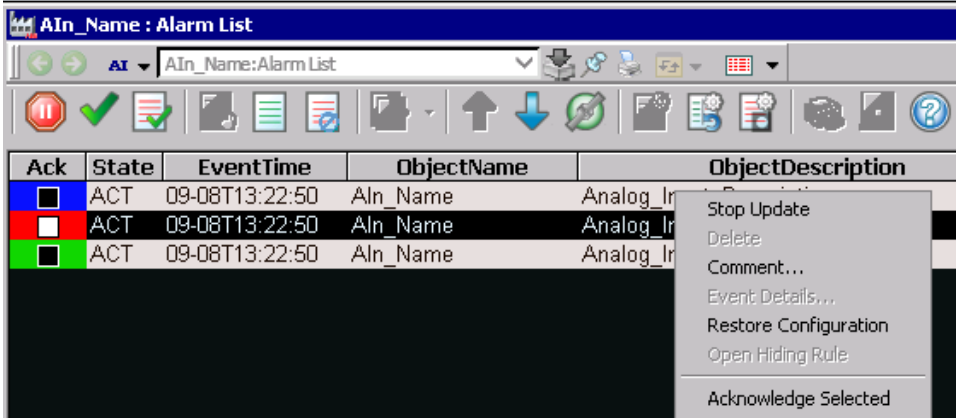
- 4. Acknowledge an individual alarm by right-clicking the alarm and selecting **Acknowledge Selected** from the context menu.



- 5. Acknowledge an individual alarm by right-clicking an alarm and selecting **Acknowledge** from the context menu.



- 6. Acknowledge multiple alarms by selecting the desired alarms (CTRL+mouse click) and selecting **Acknowledge Selected** from the context menu.



6.5 Faceplate alarms

The alarm control icon in a faceplate indicates the highest priority of alarms and the number of active alarms. Faceplate also includes a direct link button to the alarm list of the device.

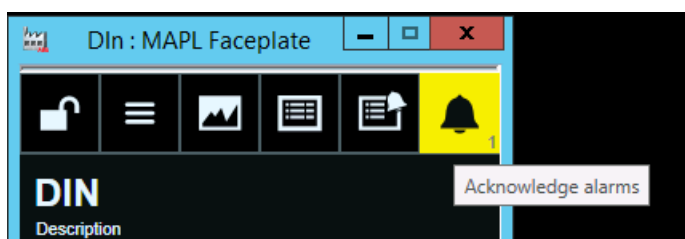


Figure 24 Alarm indications of a faceplate

6.5.1 Acknowledging alarms via faceplate

Acknowledging alarms via faceplate is possible depending on the system configuration. The alarm control icon button acknowledges all unacknowledged alarms of the device with one click.

- 1. Acknowledge all unacknowledged alarms by clicking alarm control icon button.



6.6 Disabled alarm

The alarm is automatically disabled by the system if it is triggered in predefined occurrences within a short period of time without acknowledging. Disabling takes place after three occurrences by default. The alarm can also be disabled by the user if manual disabling is configured to the system.

Refer to Table 20 for the indication of a disabled alarm in a graphical element.

6.6.1 Viewing a disabled alarm

Automatically disabled alarm can be seen in the normal **Alarm List** view with the ABL (auto blocked) state.

Manually disabled alarms of the complete system can be viewed in **Disabled Alarm List** in the same way as the other alarms. See chapter **Error! Reference source not found..**

6.7 Hidden alarm

Hiding is a way of avoiding alarm situations where numerous sequential alarms make it hard to determine the root cause of a problem. By using the hiding function, it is possible to hide non-relevant equal alarms. The hiding of alarms is initiated by hiding rules, which can be process conditions or logical expressions.

6.7.1 Viewing a hidden alarm

Hidden alarms of the complete system are viewed in **Hidden Alarm List** similarly to other alarms. See chapter **Error! Reference source not found..**

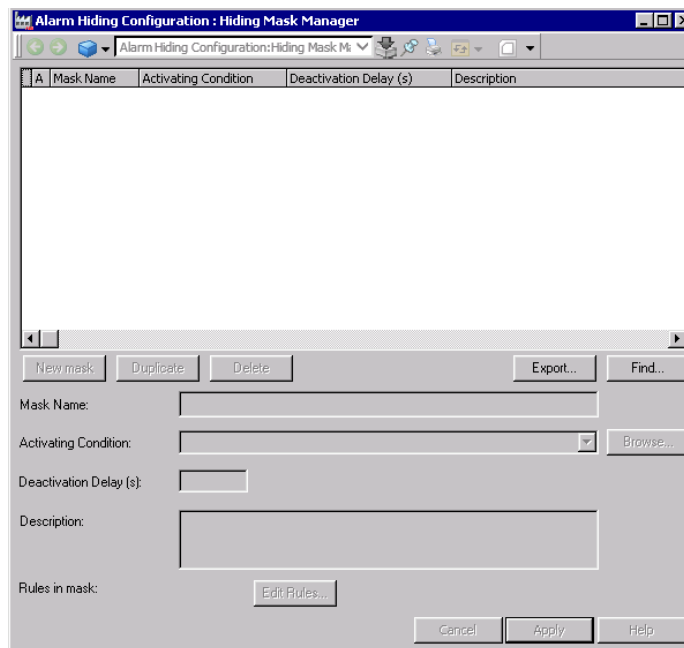
6.7.2 Viewing hiding configurations

You can view the hiding configurations.

1. Click the **View hiding configuration** button in the alarm list.



Hiding Mask Manager opens.



Refer to Table 20 for the indication of a hidden alarm in a graphical element.

6.8 Alarm classes and filtering

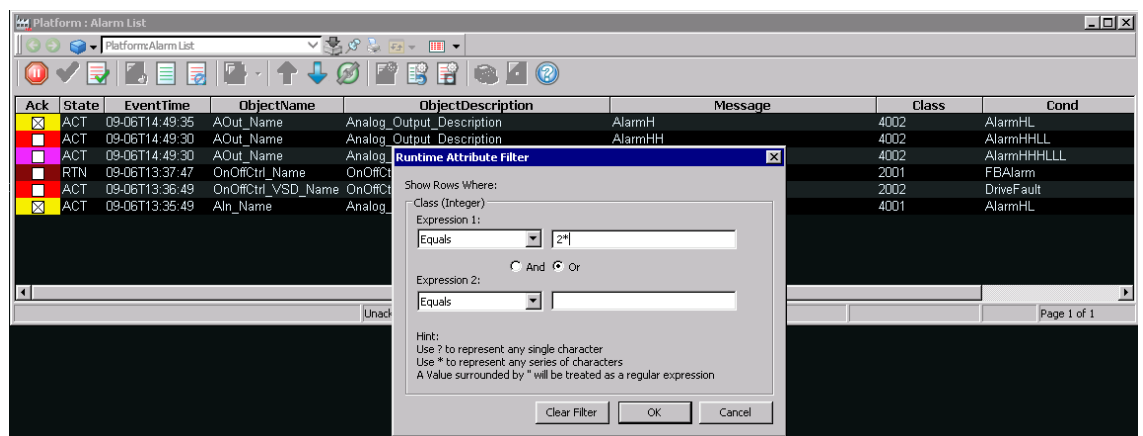
With alarm class parameters alarms can be divided into different groups e.g. according to the same location, system part etc. An alarm class can be used for filtering an alarm list to assist in viewing alarms from the devices which are e.g. connected together.

6.8.1 Filtering an alarm list

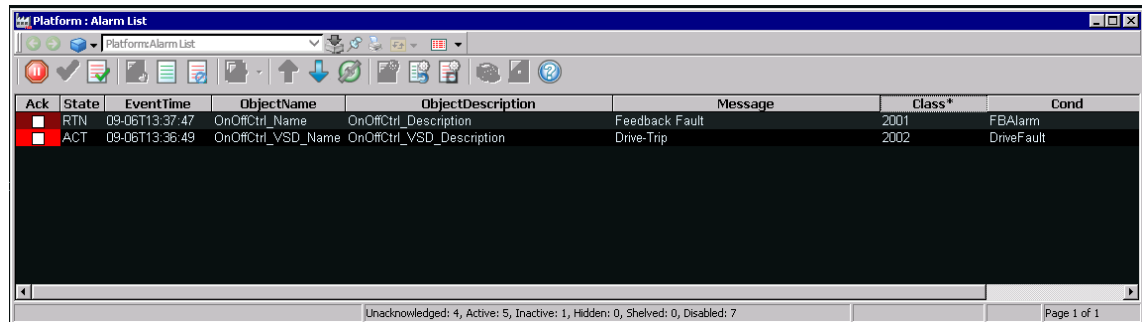
You can filter expressions in any alarm list column by right-clicking the column header. The **Class** column provides an example as follows:

1. Right-click the **Class** column header in an alarm list.

The **Runtime Attribute Filter** window opens.



1. Configure the expressions for filtering the alarm list according to the class.
Active filtering is indicated with asterisk (*) on the **Class** column header when the expression for filtering is in place.



Ack	State	EventTime	ObjectName	ObjectDescription	Message	Class *	Cond
☐	RTN	09-06T13:37:47	OnOffCtrl_Name	OnOffCtrl_Description	Feedback Fault	2001	FBAAlarm
☒	ACT	09-06T13:36:49	OnOffCtrl_VSD_Name	OnOffCtrl_VSD_Description	Drive-Trip	2002	DriveFault

Unacknowledged: 4, Active: 5, Inactive: 1, Hidden: 0, Shelved: 0, Disabled: 7

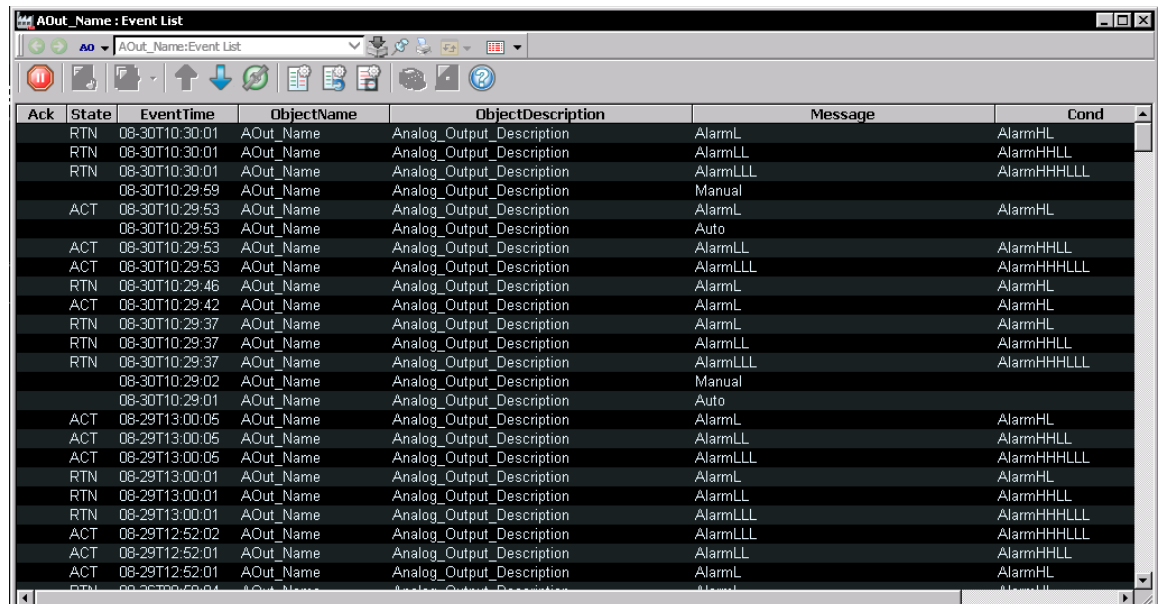
Page 1 of 1

2. Remove filters in the **Runtime Attribute Filter** window by clicking the **Clear Filter** button.

7 Events

In addition to alarms, the system generates events from the changes in a process e.g. starting and stopping a device, mode changes etc. These are presented in the event list. Alarm history is also stored in the event list for possible later viewing. For more details on the device-specific events, refer to the Function Description of each control module.

Event list consists of the same columns as the alarm list (see Table 21) except the **Class** column which is provided only in the alarm list.



Ack	State	EventTime	ObjectName	ObjectDescription	Message	Cond
	RTN	08-30T10:30:01	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	RTN	08-30T10:30:01	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	RTN	08-30T10:30:01	AOut_Name	Analog_Output_Description	AlarmLLL	AlarmHHLLL
	RTN	08-30T10:29:59	AOut_Name	Analog_Output_Description	Manual	
	ACT	08-30T10:29:53	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
		08-30T10:29:53	AOut_Name	Analog_Output_Description	Auto	
	ACT	08-30T10:29:53	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	ACT	08-30T10:29:53	AOut_Name	Analog_Output_Description	AlarmLLL	AlarmHHLLL
	RTN	08-30T10:29:46	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	ACT	08-30T10:29:42	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	RTN	08-30T10:29:37	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	RTN	08-30T10:29:37	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	RTN	08-30T10:29:37	AOut_Name	Analog_Output_Description	AlarmLLL	AlarmHHLLL
		08-30T10:29:02	AOut_Name	Analog_Output_Description	Manual	
		08-30T10:29:01	AOut_Name	Analog_Output_Description	Auto	
	ACT	08-29T13:00:05	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	ACT	08-29T13:00:05	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	ACT	08-29T13:00:05	AOut_Name	Analog_Output_Description	AlarmLLL	AlarmHHLLL
	RTN	08-29T13:00:01	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	RTN	08-29T13:00:01	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	RTN	08-29T13:00:01	AOut_Name	Analog_Output_Description	AlarmLLL	AlarmHHLLL
	ACT	08-29T12:52:02	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	ACT	08-29T12:52:01	AOut_Name	Analog_Output_Description	AlarmLL	AlarmHHLL
	ACT	08-29T12:52:01	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL
	RTN	08-29T12:52:01	AOut_Name	Analog_Output_Description	AlarmL	AlarmHL

Figure 25 Event list

There are two types of event lists:

- HW and system event list of the complete system (accessible from the workplace top row button)
- Individual device or system-specific event list (accessible from the context menu or from the faceplate top row button)

Table 24 Event list buttons

Event list button	Description
	Pin/unpin the event list
	Print the list
	Start, restart or stop list updates. If you click the Start/Stop button the event list stops updating until you click the button again. While the list update is stopped, you can easily view the error list. When the event list is stopped, a red and orange frame is shown around the event list to indicate that the list update is stopped.
	Opens a window with extended information about the selected event.

Event list button	Description
	Select runtime attribute filter. Removes the current filter. Click the drop-down menu to select a predefined attribute filter. A selected filter is indicated between the toolbar and the event list.
	Page up/page down. Shows the previous/next 500 events in the list.
	Connected to all servers. Opens System Status Viewer.
	View configuration. Not for operator use.
	Reset runtime configuration changes. Restores the initial view if any changes are done to the event list.
	View hiding configuration. Opens Hiding Mask Manager for viewing event hiding masks.
	Print List. The current list is printed on a default local or network printer
	Print Preview. The current list is presented in a preview window (only if you have a printer software installed on your workstation).
	Online Help for more information.

7.1 Filtering an event list

Event lists are filtered in the **Runtime Attribute Filter** window in the same way as alarm lists. See chapter 6.8.1.

Event list can show a maximum of 500 events in total. However, with filtering you are able to scroll back to a certain time period to view past events.

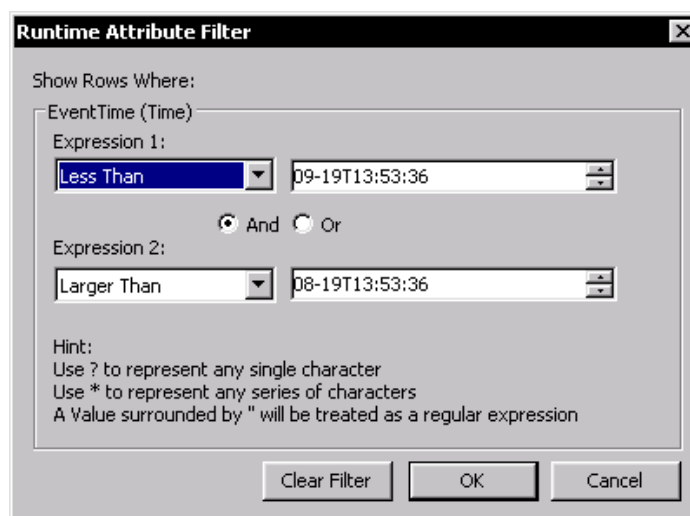


Figure 26 Filtering for a period of time

8 Trends

8.1 General

There are two types of trends in the system:

- Ready-made element trends
- User-defined operator trends (optional)

The ready-made trends display the history data of a signal or multiple signals graphically. The history data and real-time data are seamlessly integrated in the trend.

The trend display consists of three areas:

- Trend area
- Trend toolbar
- Trend table

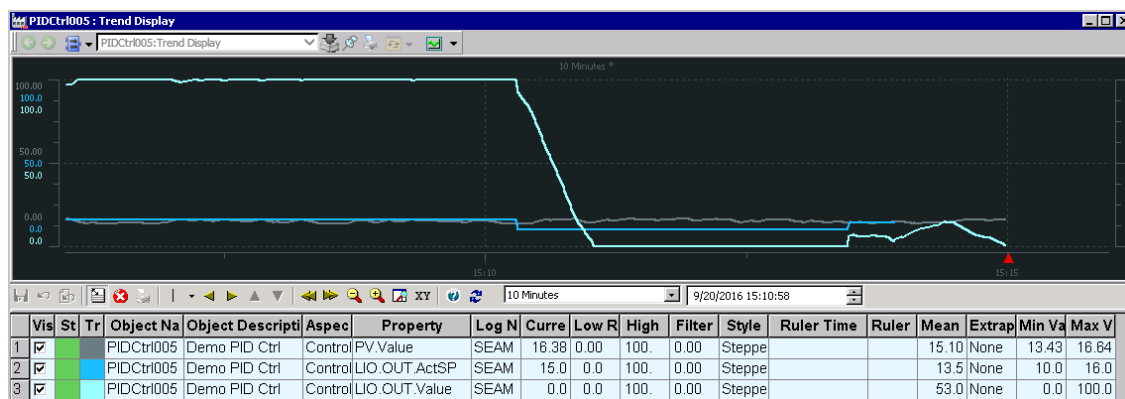


Figure 27 Trend display with 3 channels

8.1.1 Accessing ready-made trends

1. Select **Trend Display** in the context menu to access the ready-made trend. For more details on the context menu, see chapter 5.5.2.



Alternatively:

1. Click the **Trend** button in the faceplate to access the ready-made trend.



8.1.2 Accessing user-defined operator trends

There can be an optional, user-defined and collected display for operator trends in the system for the maximum of ten traces. The outcome depends on the project-specific solution. Online changes can be done in all trend displays but you can save changes only to operator trends.

8.2 Trend area

The trend area displays the trend data as traces. Different tools are provided to modify the view of the traces. There is also a set of hotkeys that can be used to modify the trend area.

The trend area is edge-sensitive. If you click the mouse in the trend area and drag it over the grid edge, the trend area starts to scroll in that direction, see Figure 28. As a result, updating the trend is blocked. Unblock the trend by clicking the  button.

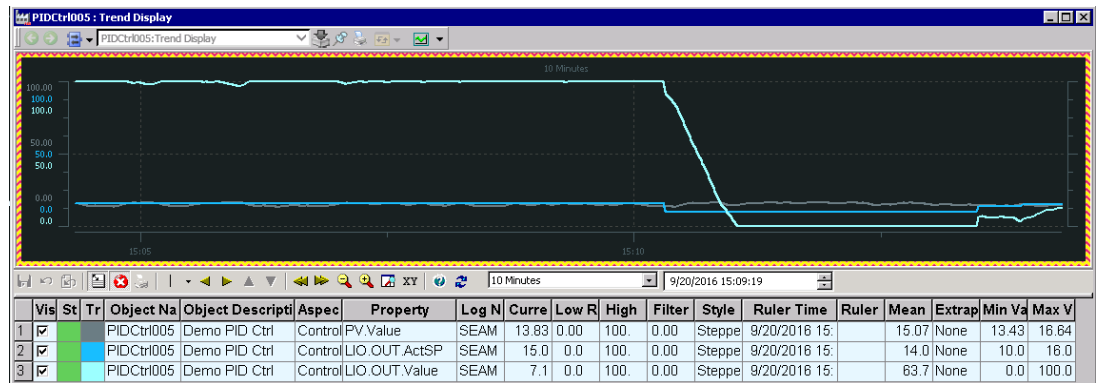


Figure 28 Blocked trend indicated with a yellow-red border

8.2.1 Adjusting the trend area size

You can modify the size of the trend area and trend table according to your preferences.

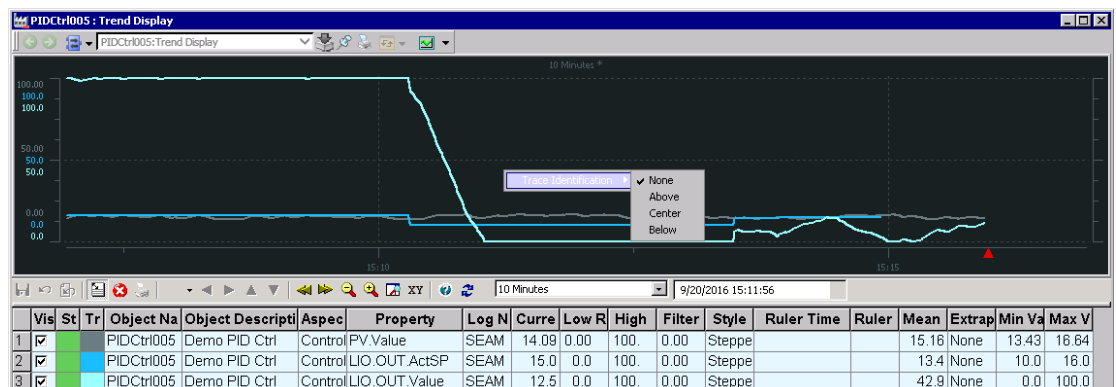
1. Drag the split bar located between the trend toolbar and the trend table to the desired position.
2. Enlarge the trend table until all rows are visible but not further.

The split bar does not affect the trend toolbar.

8.2.2 Identifying traces

Each trace can have its number drawn in the trend area to help identify the different traces.

1. Right-click the trend area.
Trace Identification pop-up menu opens.
2. Select the location of the number identifying the traces.



8.3 Trend header and trend toolbar

Frequently used functions to operate the trend display are placed in the following:

- Trend header located above the trend area
- Trend toolbar located between the trend area and the trend table

Table 25 Trend header buttons

Button	Description
	Pin/unpin the trend
	Print the trend

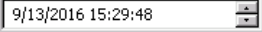


Figure 29 Trend toolbar

Table 26 Trend toolbar buttons

Button	Description
	Save configuration The Save button is enabled when changes to the trend configuration have been made. Depending on the permissions, you can save the changed configuration. Available only in Operator Trend.
	Cancel changes The Cancel changes button cancels all unsaved changes in the trend display view. Note that not all changes can be canceled. Available only in Operator Trend.
	Reset to template The Reset to template button resets all applicable data in the trend display configuration to the default read from the template configuration. Available only in Operator Trend.
	Hide/Show table The Hide/Show Table button shows or hides the trend table. When the button is clicked, the table is visible. When the table is hidden, it is replaced by a small table, showing trace colors and logged object in the form “object name: property – object description”.
	Block/Unblock The Block/Unblock button toggles the updating of the graphical view. Yellow-red border around the trend area indicates that the graphical view updating is stopped. Also the following operator actions cause the graphical view to be blocked:

Button	Description
	- Moving scope in any direction - Zooming - Changing the selected time area in the trend toolbar
	Print Trend The Print Trend button prints the trend display and the contents of the trend table. It maximizes the window before making the screen shot and scales the trend table so that all information fits on one page.
	Select Ruler With different rulers you can e.g. zoom in on a time interval and read the time and value for a specific time in the trace. The button has a drop-down menu to select any of the five different ruler styles, or a no ruler option. The ruler styles are vertical, vertical size, horizontal, horizontal size and area size.
	Move Ruler Move the selected ruler left, right, up and down.
	Move Scope Use the Move Scope Left/Right buttons, to pan the graphical view in the selected direction. The buttons move the scope by 25% of the current time scope. The panning blocks the trend updating. Alternatively, move the scope by selecting the vertical ruler and moving it outside the grid with the mouse.
	Zoom out/in The Zoom out/in buttons let the operator zoom in or zoom out around the center point of the scope. Zooming out increases the scope by 50%. Zooming in decreases the scope by a third. The result of a zoom in followed by a zoom out or vice versa leaves the scope unchanged. Zooming can also be done by using the ruler.
	Magnifying Glass The Magnifying glass button toggles the magnifying glass mode. It sets up the magnifying glass area with a default start and end time (about 20% centered), using 35% of the area for the magnifying glass. To resize the magnifying glass area, position the pointer at the edge of the grey area, click the mouse button, move the pointer and release the mouse button. To move the magnifying glass area, place the pointer at the center of the grey area and drag it to the right place. The magnifying glass shows a dynamic view of the specified time scope. It does not move along with the time axis, i.e. if you put it at the end of the time scope, the

Button	Description
	magnifying glass area continuously shows the latest values.
	XY Plot Two traces can be drawn in an XY Plot. Not applicable in time-based trends.
	Help Use the Help button for more information.
	Refresh Use the Refresh button for value refreshing.
	Time Scope Select the time scope for the trend display in the drop-down menu. The default value comes from the trend template. It is possible to write a time scope directly to the drop-down menu. The available units are year, month, day, hour, minute and second in any combination. If you enter a new scope, it is added to the list of available scopes in the drop-down menu. With the operator trends the changes can be saved to the configuration. Note that if the scope is changed by zooming, the actual scope may not correspond to the scope displayed in the drop-down menu.
	Selected Time As an alternative, you can navigate forward and backward in time by specifying the date and time of the center point in the trend area. To change the time, click the field you want to modify (hours, minutes, seconds, day, month or year) and do one of the following: • Use the keyboard up/down arrows. • Use the up/down arrows of the entry field. • Write the value.

8.4 Trend table

The columns in the trend table are used for modifying the behavior of the traces in the trend display. The different columns are described in Table 27.

You can make some adjustments to a trace on a trend display as follows:

- Show and hide traces.
- Set high and low range.
- Filter the signal. Apply a low-pass filter to remove noise from a signal.
- Change the trace style.

Table 27 *Trend table columns*

Column	Description
Visible	A checkbox indicating whether the trace is visible or not. Clicking the checkbox toggles the visible state.
Status	The data collection status. Logical colors are used to display the data collection status. If everything is OK, the color is green. If something goes wrong with the data, the color of the cell is red. While a request for data is in progress the color is flashing yellow.
Trace Color	The color of the respective trace.
Object Name	The name of the selected object. You can type an object name or path to a cell in this column. The input is only accepted if it refers to an existing object.
Object Description	The description of the selected object.
Aspect	The property aspect of the object that is selected. Available property aspects on the objects can be selected from the drop-down menu.
Property	The property of the object which is displayed in the trend display. You can select the available properties on the object from the drop-down menu, or type the desired property. When SHIFT is pressed only logged properties appear in the property drop-down list.
Log Name	Selection of the log which is displayed. If SEAMLESS is selected, the data is fetched from the history log if it is defined for the selected property. If TRIM is selected, the trend display displays a trim trace showing only the data starting at the time the trend display was opened. This data is lost when the trend display is closed.
Current Value	Current value
Low Range	The lowest Y-axis value of the trace. You can change it by typing another value and pressing ENTER or using the arrows.
High Range	The highest Y-axis value of the trace. You can change it by typing another value and pressing ENTER or using the arrows.
Filter	The filter value to use. The default is zero (0), indicating no filter. The value must be between zero (0) and one (1), not including one. Only values above 0.5 have a noticeable effect.
Style	The drawing style selected for this trace (Normal , Linear , Stepped , Filled and Point as options).
Ruler Time	The time at the position of the ruler when the ruler is active.

Column	Description
Ruler Value	The value at the position of the ruler for each trace when the ruler is active.
Mean Value	The average value of the current scope.
Extrapolate	The type of extrapolation which is selected. A new value can be selected from the drop-down menu. None: no extrapolation of the trace value is done. Value: the trace is continued from the last point until the current time with the same value as the last point. Slope: the trace is continued from the last point until the current time with the same slope as between the two last points.
Min Value	The minimum value of the current scope.
Max Value	The maximum value of the current scope.

Table 28 Hotkeys in the trend display window

Button	Description
I	Zoom in
O	Zoom out
A	Toggle between area zoom and vertical ruler
P	Toggle between normal and X/Y plot mode
G	Toggle between normal and looking glass mode
Q	Removes the ruler
N	Sets auto scroll on
R	Resets Y zoom
L	Clears trim curves and redraws trend
Z	Toggle between ruler and zoom mode
X	Toggles mode between vertical ruler and horizontal ruler, or between vertical zoom and horizontal zoom
C	Removes the ruler
Q	Removes the ruler
Shift-Ctrl-C	Puts data on clipboard with full time resolution
B	Toggle between Y buffer and order draw
H	Displays Trend Keyboard Help
M-B	Toggle between bad data mode Nothing and Dashed
M-D	Toggle between draw modes: Linear, Stepped, Filled and Point
M-I	Toggle between item draw mode
Ctrl-C	Puts data on clipboard

Button	Description
<Delete>	Removes the ruler
<Back>	Removes the ruler
<Escape>	Removes the ruler
Shift<Left>	Scrolls left
<Left>	Moves ruler left
Shift<Right>	Scrolls right
<Right>	Moves ruler right
<Up>	Moves horizontal ruler up
<Down>	Moves horizontal ruler down
<Space>	Executes operation performed using the keyboard
<Enter>	Executes operation performed using the keyboard

8.4.1 Adding traces to operator trends

1. Select the objects to the trend table by dragging and dropping the element from the display.
Alternatively:
 1. Click the cell in the **Object Name** column and click the three-dot button becoming visible.
The **Select Object** window opens.
 2. Select the desired object from the **Functional Structure**.
 3. Click the cell in the **Property** column to select the desired signal of the object.
If you press SHIFT when clicking the cell, the opened list shows only signals which have a history log.

8.5 Using Silence Alarm Buzzer button

The **Silence Alarm Buzzer** button in the workplace top row is used for silencing a buzzer if the responsibility of the area is taken by the user.



Figure 30 Silence Alarm Buzzer button

Revision history

Rev.	Description	Date [yyyy-mm-dd]	Department	Prepared by
A	First release.	2019-10-14	On the cover	On the cover